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| 09/832,601                   | 04/11/2001  | Karl James Molnar    | 8194-473            | 1484             |
| 20792                        | 7590        | 03/28/2005           | EXAMINER            |                  |
| MYERS BIGEL SIBLEY & SAJOVEC |             |                      | WANG, TED M         |                  |
| PO BOX 37428                 |             |                      | ART UNIT            |                  |
| RALEIGH, NC 27627            |             |                      | PAPER NUMBER        |                  |
|                              |             |                      | 2634                |                  |

DATE MAILED: 03/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/832,601

Applicant(s)

MOLNAR ET AL.

Examiner

Ted M Wang

Art Unit

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 April 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10, 11, 14, 17-23, 25, 26 and 28-36 is/are rejected.
- 7) ☒ Claim(s) 9, 12, 13, 15, 16, 24, 27 and 37 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 12/18/01, 7/25/02, 8/29/02
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-6, 10, 14, 17-23, 25, 26, and 28-35 are rejected under 35 U.S.C. 102(e) as being anticipated by Bergstrom et al. (US 6,118,805).

□ With regard claim 1, Bergstrom et al. discloses a method of demodulating a received signal, the method comprising:

providing an interference map containing information regarding a plurality of candidate interference sources (Figs.2-3 element 46, column 6 lines 1-19, and column 9 lines 46-64);

identifying any of the candidate interference sources that comprise a dominant interference source based on the received signal and the information regarding the plurality of candidate interference sources (Fig.2 element 18, Fig.4 element 102, column 2 lines 35-50, column 3 lines 39-61, column 5 line 62 – column 6

line 19, column 7 line 54 – column 8 line 35, column 9 lines 47-67, and column 18 lines 1-22).

demodulating (Fig.1 element 318 and Fig.2 element 18) the received signal to recover wanted information while compensating for interference with the aid of the information stored in the interference map (column 3 lines 39-61 and column 6 lines 20-38).

- With regard claim 2, Bergstrom et al. further discloses -  
identifying a plurality of candidate interference sources (Fig.2 element 18, column 2 lines 35-50, column 3 lines 39-61, column 5 line 62 – column 6 line 19, column 7 line 54 – column 8 line 35, column 9 lines 47-67, and column 18 lines 1-22);  
generating information regarding the identified candidate interference sources (Fig.2 element 18, column 2 lines 35-50, column 3 lines 39-61, column 5 line 62 – column 6 line 19, column 7 line 54 – column 8 line 35, column 9 lines 47-67, and column 18 lines 1-22); and  
storing the generated information in the interference map (Figs.2-3 element 46, column 6 lines 1-19, and column 9 lines 46-64).
- With regard claim 3, Bergstrom et al. further discloses -  
a) generating a plurality of classification measures associated with a plurality of interference scenarios (Fig.1 element 314, Figs.2 and 3 element 74, Fig.20 element 163, column 2 lines 35-50, column 3 lines 39-61, column 7 line 54 – column 8 line 35, column 9 lines 47-67, and column 18 lines 1-22).

Art Unit: 2634

- b) identify as dominant interference sources any candidate interference sources associated with the interference scenario which the classification measures indicate is the most likely interference scenario (Fig.2 elements 18, 42, column 2 lines 35-50, column 3 lines 39-61, column 5 line 62 – column 6 line 19, column 7 line 54 – column 8 line 35, column 9 lines 47-67, and column 18 lines 1-22).
- With regard claim 4, Bergstrom et al. further discloses each classification measure is based on the difference between the received signal and an expected received signal for one of the plurality of interference scenarios (Fig.1 element 314, Figs.2 and 3 element 74, Fig.20 element 163, column 2 lines 35-50, column 3 lines 39-61, column 7 line 54 – column 8 line 35, column 9 lines 47-67, and column 18 lines 1-22).
  - With regard claim 5, Bergstrom et al. further discloses jointly demodulating a desired carrier and any identified dominant interference source (Fig.1 element 304 and Fig.2 element 18, where the demodulation 318 input signal is the desired carrier and any identified dominant interference source and it is inherent that the desired carrier and any identified dominant interference source are jointly demodulated.).
  - With regard claim 6, all limitation can further be taught in Fig.2 elements 74, 66, and 42, and column 9 lines 1-16, Fig.2 element 46, and column 5 line 62 – column 6 line 19.
  - With regard claim 10, all limitation can further be taught in column 9 lines 46-66.
  - With regard claim 14, Bergstrom et al. further discloses -

error correction decoding the demodulated received signal to provide an estimate of a desired signal (Fig.2 elements 60, 66, and column 7 lines 3-30); processing the received signal to determine parameters associated with at least one interference source (Fig.2 element 18, Fig.4 element 102, column 2 lines 35-50, column 3 lines 39-61, column 5 line 62 – column 6 line 19, column 7 line 54 – column 8 line 35, column 9 lines 47-67, and column 18 lines 1-22); and storing the determined parameters in the interference map (Figs.2-3 element 46, column 6 lines 1-19, and column 9 lines 46-64).

- With regard claim 17, which is a demodulation method claim with a desired signal along with a co-channel interference source and noise that related to claim 1, all limitation is contained in claim 1. More specifically, the co-channel interference source is shown in Fig.2 element 40 and column 5 lines 40-61 and the noise is shown in Fig.2 element 38 and column 5 lines 40-61. The explanation of all the limitation is already addressed in the above paragraph.
- With regard claim 18, which is a method claim related to claims 17 and 3, all limitation is contained in claims 17 and 3. The explanation of all the limitation is already addressed in the above paragraph.
- With regard claim 19, which is a method claim related to claims 17 and 4, all limitation is contained in claims 17 and 4. The explanation of all the limitation is already addressed in the above paragraph.

- With regard claim 20, which is a method claim related to claims 17 and 6, all limitation is contained in claims 17 and 6. The explanation of all the limitation is already addressed in the above paragraph.
- With regard claim 21, which is a method claim related to claims 17 and 7, all limitation is contained in claims 17 and 7. The explanation of all the limitation is already addressed in the above paragraph.
- With regard claim 22, Bergstrom et al. discloses-  
identifying any dominant co-channel interference component in the received signal (Fig.2 element 18, Fig.4 element 102, column 2 lines 35-50, column 3 lines 39-61, column 5 line 62 – column 6 line 19, column 7 line 54 – column 8 line 35, column 9 lines 47-67, and column 18 lines 1-22);  
classifying the interference scenario associated with the received signal based on the results of the identifying step (Fig.1 element 314, Figs.2 and 3 element 74, Fig.20 element 163, column 2 lines 35-50, column 3 lines 39-61, column 7 line 54 – column 8 line 35, column 9 lines 47-67, and column 18 lines 1-22);  
selecting a demodulation algorithm based on the interference scenario classification (column 9 line 46 – column 10 line 34); and  
demodulating the received signal according to the selected demodulation algorithm (Fig.1 element 318 and Fig.2 element 18, column 3 lines 39-61, and column 6 lines 20-38).
- With regard claim 23, Bergstrom et al. further discloses-

providing an interference map containing information regarding a plurality of candidate interference sources (Figs.2-3 element 46, column 6 lines 1-19, and column 9 lines 46-64), and

wherein information from the interference map is used in demodulating the received signal in cases where the interference scenario associated with the received signal includes a dominant co-channel interference source (Fig.1 element 304, Fig.2 element 18, 42, 44, 46, 74, 76, and 78, column 3 lines 29-61, column 7 line 54 – column 8 line 35, and column 9 line 17 – column 10 line 50).

- With regard claim 25, all limitation is contained in claim 23. The explanation of all the limitation is already addressed in the above paragraph.
- With regard claim 26, which is a system claim related to claim 22, all limitation is contained in claim 22. The explanation of all the limitation is already addressed in the above paragraph.
- With regard claim 28, which is a system claim related to claims 22 and 5, all limitation is contained in claims 22 and 5. The explanation of all the limitation is already addressed in the above paragraph.
- With regard claim 29, all limitation is contained in claim 23. The explanation of all the limitation is already addressed in the above paragraph.
- With regard claim 30, Bergstrom et al. further discloses-  
an update system (Fig.2 elements 66, 42, 36, and 35), wherein the update system updates the information stored in the interference map based on the output of the demodulator (column 7 line 22 – column 8 line 67).



- With regard claim 31, which is system means function claim related to claim 1, all limitation is contained in claim 1. The explanation of all the limitation is already addressed in the above paragraph.
- With regard claim 32, which is system means function claim related to claim, all limitation is contained in claim 2. The explanation of all the limitation is already addressed in the above paragraph.
- With regard claim 33, Bergstrom et al. further discloses-  
providing an interference map containing information regarding a plurality of candidate interference sources (Figs.2-3 element 46, column 6 lines 1-19, and column 9 lines 46-64);  
identifying one of the candidate interference sources that comprises a dominant interference source based on the received signal and the information regarding the plurality of candidate interference sources (Fig.2 element 18, Fig.4 element 102, column 2 lines 35-50, column 3 lines 39-61, column 5 line 62 – column 6 line 19, column 7 line 54 – column 8 line 35, column 9 lines 47-67, and column 18 lines 1-22);  
demodulating (Fig.1 element 318 and Fig.2 element 18) the received signal while canceling at least part of the contribution of the identified dominant interference source using at least some of the information regarding the identified interference source contained in the interference map (column 3 lines 39-61 and column 6 lines 20-38, and Fig.2 elements 66, 42, 36, and 35, and column 7 line 22 – column 8 line 67).

- With regard claim 34, which is a method claim related to claims 33 and 3, all limitation is contained in claims 33 and 3. The explanation of all the limitation is already addressed in the above paragraph.
- With regard claim 35, all limitation can further be taught in column 9 lines 1-16.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 7, 8, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bergstrom et al. (US 6,118,805) in view of Wiedemman et al. (US 5,905,543).

- With regard claim 7, Bergstrom et al. further discloses determining a position where the received signal is received (column 5 lines 1-6, column 5 lines 25-32, and column 7 lines 31-38); and storing the estimated updated information in the interference map (Fig.2 elements 74, 66, and 42, and column 9 lines 1-16, Fig.2 element 46, and column 5 line 62 – column 6 line 19).

Bergstrom et al. discloses all of the subject matter as described in the above paragraph except for specifically teaching -

a) determining a position associated with at least one of the plurality of candidate interference sources;

b) estimating updated information regarding the at least one of the plurality of candidate interference sources based on the position where the received signal is received and the position associated with the at least one candidate interference source.

However, Wiedemman et al. teaches

a) determining a position associated with at least one of the plurality of candidate interference sources (Fig.4 elements 76, 78, 80, and 82, Fig.5 element 82 and 96, column 5 lines 11-29, and column 6 lines 22-53);

It is desirable to determine a position associated with at least one of the plurality of candidate interference sources in order to save the power in radio device (column 1 lines 51-67).

Wiedemman et al. further teaches b) estimating updated information regarding the at least one of the plurality of candidate interference sources based on the position (Fig.4 elements 76, 78, 80, and 82, Fig.5 element 82 and 96, column 5 lines 11-29, and column 6 lines 22-53) where the received signal is received and the position associated with the at least one candidate interference source (column 6 line 22 –column 7 line 49).

It is also desirable to estimate updated information regarding the at least one of the plurality of candidate interference sources based on the position where the received signal is received and the position associated with the at least one candidate interference source in order to reduce the power required by the user terminal (column 1 lines 51-67).

Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the method as taught by Wiedemman et al. in which, a) determining a position associated with at least one of the plurality of candidate interference sources; b) estimating updated information regarding the at least one of the plurality of candidate interference sources based on the position where the received signal is received and the position associated with the at least one candidate interference source, into Bergstroms' demodulation method so as to reduce the power required by the user terminal.

- With regard claim 8, Bergstrom et al. further discloses determining a position where the received signal is received (column 5 lines 1-6, column 5 lines 25-32, and column 7 lines 31-38); and storing the information regarding the plurality of interference sources in the interference map along with the determined position (Fig.2 elements 74, 66, and 42, and column 9 lines 1-16, Fig.2 element 46, and column 5 line 62 – column 6 line 19).

Bergstrom et al. discloses all of the subject matter as described in the above paragraph except for specifically teaching updating the interference map with the stored information regarding the plurality of interference sources when it is determined that the wireless terminal is within a specified distance from the determined position.

However, Wiedemman et al. teaches updating the interference map with the stored information regarding the plurality of interference sources when it is

determined that the wireless terminal is within a specified distance from the determined position (column 5 lines 11-56 and column 6 lines 22-53).

It is also desirable to updating the interference map with the stored information regarding the plurality of interference sources when it is determined that the wireless terminal is within a specified distance from the determined position in order to save the power required by the user terminal (column 1 lines 51-67).

Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the method as taught by Wiedemman et al. in which, updating the interference map with the stored information regarding the plurality of interference sources when it is determined that the wireless terminal is within a specified distance from the determined position, into Bergstroms' demodulation method so as to save the power required by the user terminal.

- With regard claim 36, Bergstrom et al. discloses all of the subject matter as described in the above paragraph except for specifically teaching subtracting out of the received signal known symbols transmitted by the identified dominant interference source.

However, Wiedemman et al. teaches subtracting out of the received signal known symbols transmitted by the identified dominant interference source (column 1 line 50-67, column 4 lines 1-19, and column 6 lines 1-21).

It is desirable to subtracting out of the received signal known symbols transmitted by the identified dominant interference source in order to reduce the power

required by a radio device while maintaining a suitable signal-to-noise ratio (column 1 lines 50-67). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the method as taught by Wiedemman et al. in which, subtracting out of the received signal known symbols transmitted by the identified dominant interference source, into Bergstroms' demodulation method so as to save the power required by a radio device while maintaining a suitable signal-to-noise ratio.

5. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bergstrom et al. (US 6,118,805) in view of Shah et al. (US 6,442,384).

- With regard claim 11, Bergstrom et al. discloses all of the subject matter as described in the above paragraph except for specifically teaching that the plurality of candidate interference sources includes information regarding a relative timing of a desired signal and at least one of the candidate interference sources.

However, Shah et al. teaches that the plurality of candidate interference sources includes information regarding a relative timing of a desired signal and at least one of the candidate interference sources (column 7 lines 52-65 and column 10 lines 39-53, column 11 lines 20-65).

It is desirable that the plurality of candidate interference sources includes information regarding a relative timing of a desired signal and at least one of the candidate interference sources in order to reduce the power required in a radio device while maintaining a suitable signal-to-noise ratio (column 1 lines 50-67).

Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the apparatus/method as taught by Shah et al. in which, the plurality of candidate interference sources includes information regarding a relative timing of a desired signal and at least one of the candidate interference sources, into Bergstroms' demodulation method so as to reduce the power required in a radio device while maintaining a suitable signal-to-noise ratio.

### ***Allowable Subject Matter***

6. Claims 9, 12, 13, 15, 16, 24, 27, and 37 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Conclusion***

7. Reference(s) US 6,084,919 is cited because they are put pertinent to the demodulation with interference suppression. However, none of references teach detailed connection as recited in claim.

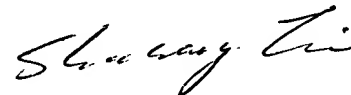
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ted M. Wang whose telephone number is 571-272-3053. The examiner can normally be reached on M-F, 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571-272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ted M Wang  
Examiner  
Art Unit 2634

Ted M. Wang



**SHUWANG LIU**  
**PRIMARY EXAMINER**